

Claims

1. A variable power distributor, which includes:

a set of transmission lines which are first and second transmission lines;

5 a two-way distributor provided on an input side of the set of the transmission lines;

a 90-degree hybrid circuit provided on an output side of the set of the transmission lines; and

10 a variable phase shifter, a variable resistance attenuator, and a power amplifier which are provided on each of the set of transmission lines between the two-way distributor and the 90-degree hybrid circuit to control an amplitude and a phase of an input signal and amplify power of the input signal, the variable power distributor being characterized by comprising:

15 a monitoring mechanism for monitoring output signals from the 90-degree hybrid circuit; and

error detection means for detecting an error present in each component between the first and second transmission lines based on a monitoring output from the monitoring mechanism.

20 2. The variable power distributor according to claim 1, characterized in that

the error detection means obtains, from the monitoring mechanism, output signals on the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated and output signals on the first and second transmission lines when a phase of the variable phase shifter

provided on the second transmission line is rotated, and detects the error present in each component between the first and second transmission lines using a rotating element electric field vector method.

5 3. The variable power distributor according to claim 2, characterized by further comprising

control means for controlling the amplitude and the phase by correcting set values for the variable phase shifters and the variable resistance attenuators based on a detection result obtained by the error detection means.

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4. The variable power distributor according to claim 3, characterized in that the control means calculates an amplitude ratio and a phase difference between the first and second transmission lines based on the detection result obtained by the error detection means to correct the set values for the variable phase shifters and the variable resistance attenuators.

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5. An error detection method for a variable power distributor that includes: a set of transmission lines which are first and second transmission lines; a two-way distributor provided on an input side of the set of the transmission lines; a 90-degree hybrid circuit provided on an output side of the set of the transmission lines; and a variable phase shifter, a variable resistance attenuator, and a power amplifier which are provided on each of the set of transmission lines between the two-way distributor and the 90-degree hybrid circuit to control an amplitude and a phase of an input signal and amplify power of the input signal and detects an error present in each

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component between the first and second transmission lines, the error detection method being characterized by comprising:

detecting output signals from the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated;

5 detecting output signals based on the first and second transmission lines when a phase of the variable phase shifter provided on the second transmission line is rotated; and

detecting the error present in each component based on the output signals using a rotating element electric field vector method.

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6. A set value correction method for the variable power distributor, characterized by comprising:

obtaining an amplitude ratio and a phase difference between the first and second transmission lines based on a detection result of the error detected by the error detection method for the variable power distributor according to claim 5; and
15 correcting set values for the variable phase shifters and the variable resistance attenuators.

7. The variable power distributor according to claim 1, characterized in that
20 the error detection means obtains, from the monitoring mechanism, output signals on the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated and output signals on the first and second transmission lines when a phase of the variable phase shifter provided on the second transmission line is rotated, and detects the error present in

each component between the first and second transmission lines using an improved rotating element electric field vector method.

8. The variable power distributor according to claim 7, characterized by
5 further comprising

control means for controlling the amplitude and the phase by correcting set values for the variable phase shifters and the variable resistance attenuators based on a detection result obtained by the error detection means.

10 9. The variable power distributor according to claim 8, characterized in that
the control means calculates an amplitude ratio and a phase difference between the first and second transmission lines based on the detection result obtained by the error detection means to correct the set values for the variable phase shifters and the variable resistance attenuators.

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20 10. An error detection method for a variable power distributor that includes: a set of transmission lines which are first and second transmission lines; a two-way distributing circuit provided on an input side of the set of the transmission lines; a 90-degree hybrid circuit provided on an output side of the set of the transmission lines; and a variable phase shifter, a variable resistance attenuator, and a power amplifier which are provided on each of the set of transmission lines between the two-way distributor and the 90-degree hybrid circuit to control an amplitude and a phase of an input signal and amplify power of the input signal and detects an error present in each component between the first and second transmission lines, the error

detection method being characterized by comprising:

detecting output signals from the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated;

detecting output signals from the first and second transmission lines when a phase of the variable phase shifter provided on the second transmission line is rotated; and

detecting the error present in each component from the output signals using a rotating element electric field vector method.

10 11. A set value correction method for the variable power distributor, characterized by comprising:

obtaining an amplitude ratio and a phase difference between the first and second transmission lines based on a detection result of the error detected by the error detection method for the variable power distributor according to claim 10; and

15 correcting set values for the variable phase shifters and the variable resistance attenuators.

12. A variable power distributor including:

a set of transmission lines which are first and second transmission lines;

20 a 90-degree hybrid circuit provided on each of input and output sides of the set of the transmission lines; and

a variable phase shifter and a variable resistance attenuator which are provided on each of the set of transmission lines between the 90-degree hybrid circuit provided on the input side and the 90-degree hybrid circuit provided on the

output side to control an amplitude and a phase of an input signal, the variable power distributor being characterized by comprising:

a monitoring mechanism for monitoring output signals from the 90-degree hybrid circuit; and

5 error detection means for detecting an error present in each component between the first and second transmission lines based on a monitoring output from the monitoring mechanism.

10 13. The variable power distributor according to claim 12, characterized in that the error detection means obtains, from the monitoring mechanism, output signals on the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated and output signals on the first and second transmission lines when a phase of the variable phase shifter provided on the second transmission line is rotated and

15 detects the error present in each component between the first and second transmission lines using an improved rotating element electric field vector method.

14. The variable power distributor according to claim 13, characterized by further comprising

20 control means for controlling the amplitude and the phase by correcting set values for the variable phase shifters and the variable resistance attenuators based on a detection result obtained by the error detection means.

15. The variable power distributor according to claim 14, characterized in that

the control means calculates an amplitude ratio and a phase difference between the first and second transmission lines based on the detection result obtained by the error detection means to correct the set values for the variable phase shifters and the variable resistance attenuators.

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16. An error detection method for a variable power distributor that includes: a set of transmission lines which are first and second transmission lines; a 90-degree hybrid circuit provided on each of input and output sides of the set of the transmission lines; and a variable phase shifter and a variable resistance attenuator
10 which are provided on each of the set of transmission lines between the 90-degree hybrid circuit provided on the input side and the 90-degree hybrid circuit provided on the output side to control an amplitude and a phase of an input signal and detects an error present in each component between the first and second transmission lines, the error detection method being characterized by comprising:

15 detecting output signals from the first and second transmission lines when a phase of the variable phase shifter provided on the first transmission line is rotated;

detecting output signals from the first and second transmission lines when a phase of the variable phase shifter provided on the second transmission line is rotated; and

20 detecting the error present in each component based on the output signals using an improved rotating element electric field vector method.

17. A set value correction method for a variable power distributor, characterized by comprising:

obtaining an amplitude ratio and a phase difference between the first and second transmission lines based on a detection result of an error detected by the error detection method for a variable power distributor according to claim 16; and

correcting set values for the variable phase shifters and the variable
5 resistance attenuators.